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INPLASY

The correlation between serum 25-hydroxyvitamin D level and ulcerative colitis: A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202380081

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 August 2023 and was last updated on 19 August 2023.

INTRODUCTION

Review question / Objective A systematic review and meta-analysis were conducted to investigate the association between serum 25-hydroxyvitamin D levels and ulcerative colitis.

Condition being studied Ulcerative colitis (UC) is a chronic nonspecific inflammatory bowel disease whose etiology is not yet clear. The lesions are mainly located in the rectum and colon and are limited to the mucosa and submucosa. The clinical manifestations include abdominal pain, diarrhea, and bloody stools. The disease is prone to recur, seriously affecting the physical and mental health of patients. In recent years, due to changes in people's lifestyle and environmental factors, the incidence of UC has increased yearly, and UC has become a global disease.

Vitamin D is a steroid hormone closely related to human health. It is not only involved in the regulation of calcium and phosphorus metabolism and maintaining bone health and calcium homeostasis but also plays a wide role in inflammation and the immune response. Vitamin D is obtained by the action of direct sunlight on the skin and by the intake of foods, especially dairy products. Vitamin D is cycled to the liver and converted into 25-hydroxyvitamin D (25(OH)D) under the action of hepatic 25-hydroxylase; thus, 25-hydroxyvitamin D is the main circulating form and marker of vitamin D. Due to its stable concentration in serum, serum 25(OH)D is often used to reflect the level of vitamin D in the body.

METHODS

Participant or population We selected patients with ulcerative colitis as the research object.

Intervention Vitamin D levels of the subjects.

Comparator We selected healthy people as the control group.

Study designs to be included Case control study.

Eligibility criteria 1.Inclusion Criteria (1) The literature is a case-control study; (2) Subjects were patients with ulcerative colitis; (3) The study index was serum 25(OH)D level; (4) The control group comprised healthy people; (5) Articles published in English or Chinese. 2. Exclusion Criteria (1) Documents that cannot provide valid data; (2) If the same author published multiple articles using the same study data, only the largest or most recent study was selected; (3) The study subjects had inflammatory bowel disease, and Crohn's disease and ulcerative colitis were not distinguished. (4) There is no clear indicator of vitamin D level.

Information sources CNKI, Wanfang, VIP, PubMed, Embase, Cochrane Library.

Main outcome(s) To investigate whether serum vitamin D levels are different in patients with ulcerative colitis compared with healthy people.

Quality assessment / Risk of bias analysis The methodological quality of all literature was evaluated according to the Newcastle-Ottawa scale (NOS). The total score is 9, and studies with a total score of less than 5 were excluded.

Strategy of data synthesis Meta-analysis was performed using Review Manager5.4 and Stata17.0 software. The standard mean difference (SMD) and 95% credible interval (CI) were used as effect analysis statistics for measurement data, and the odds ratio (OR) and 95% CI were used for counting data. Heterogeneity analysis was conducted by the I2 test and Q test. If heterogeneity was high ($P < 0.1$, $I2 \geq 50\%$), a random-effects model was selected; otherwise, a fixed-effects model was selected. A funnel plot and Egger's test were carried out to evaluate publication bias. $P < 0.05$ was considered to indicate publication bias. If the funnel plot was asymmetric or $P < 0.05$, the trim and fill method was used to correct it.

Subgroup analysis Studies were divided into four subgroups according to region, year of publication, inclusion or absence of patients in remission, and test method. Heterogeneity was calculated separately for each subgroup.

Sensitivity analysis To assess the robustness and reliability of the meta-analysis, we performed a sensitivity analysis of the studies using the one-by-one elimination method. One article was eliminated at a time, and changes in the results were observed to assess whether the results of the meta-analysis changed significantly due to the influence of some studies.

Country(ies) involved China.

Keywords 25-hydroxyvitamin D; ulcerative colitis; meta-analysis.

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